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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,758	07/18/2002	James Christopher O'Gorman	Q69113	8824

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
CONNELLY CUSHWA, MICHELLE R	

ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 01/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/088,758	O'GORMAN ET AL.
	Examiner	**Art Unit**
	Michelle R. Connelly-Cushwa	2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *73-83 and 86-102* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *73-76,79-83,86,88-93,96 and 98-100* is/are rejected.

7)☐ Claim(s) *77,78,87,94,95,97,101 and 102* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 July 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Applicant's Amendment filed November 4, 2004 has been fully considered and entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 73, 74, 79, 86, 90, 91, 93 and 98-100 are rejected under 35 U.S.C. 102(b) as being anticipated by Epworth (US 4,953, 939).

Regarding claims 73 and 90; Epworth discloses an optical waveguide (fibre) for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

- a light conducting medium (optical fibre) defining a longitudinally extending optical path for guiding the light, the optical path extending longitudinally between respective spaced apart first and second ends, and
- a means (grating fringes of a Bragg reflector) for causing partial longitudinal reflections of the light along the optical path at at least two spaced apart partial reflecting locations along the optical path for deriving light of the predetermined wavelength,

- wherein the means (grating fringes) for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective length of the optical path taking account of the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path, so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other (see column 3, lines 4-16).

Regarding claims 74 and 91; the means for causing the partial reflections of the light (the grating fringes) at the at least two reflecting locations comprises a refractive index altering means for altering the effective refractive index of the light conducting medium presented to light passing along the optical path at each of the at least two reflecting locations for causing partial reflections.

Regarding claim 79; the refractive index altering means comprises a plurality of refractive index altering elements, one refractive index altering element (grating fringe) being provided for each reflecting location, the respective refractive index altering elements being located at distances from the first end along the optical path similar to the distances from the first end of the corresponding reflecting locations.

Regarding claim 86; the means for causing the partial reflections (the grating fringes) causes the partial reflections at at least three reflecting locations along the optical path.

Regarding claim 93; the respective lengths of the partial reflecting locations along the optical path are the same and the effective refractive indices of the respective reflecting locations are the same.

Regarding claim 98; each of the refractive index altering elements extends substantially transversely relative to the optical path.

Regarding claim 99; the distance from the first end along the optical path to each reflecting location is measured to the center of the reflecting location.

Regarding claim 100; the optical waveguide is a passive semiconductor optical waveguide.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 73, 74-76, 79, 80-82, 86, 88-93, 96, 98 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bendett et al. (US 6,636,678 B1).

Regarding claims 73 and 90; Figures 17A and 17B of Bendett et al. disclose an optical waveguide (waveguide) for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

- a light conducting medium defining a longitudinally extending optical path (waveguide) for guiding the light, the optical path (waveguide) extending longitudinally between respective spaced apart first and second ends, and
- a means (G) for causing partial longitudinal reflections of the light along the optical path (waveguide) at at least two spaced apart partial reflecting locations along the optical path for deriving light of the predetermined wavelength,
- wherein the means (G) for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective length of the optical path, so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

Bragg gratings, which reflect a narrow wavelength channel, exhibit a main wavelength peak centered on the wavelength to be reflected, and also exhibit reflections at harmonics of the peak wavelength that occur between reflecting locations (fringes) of the grating. The gratings (G) disclosed by Bendett et al. are Bragg gratings and therefore will exhibit the harmonic reflections.

Bendett et al. does not specifically teach that the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path is taken into account. However, it is known in the art that the optical path length between successive lines in a Bragg grating is affected by variations of the refractive index, the variations in the refractive index being the grating fringes (i.e. the means for causing the partial reflections). The oscillation wavelength of a DBR laser is determined by the Bragg reflection wavelength and the Bragg wavelength at a particular position in a grating is determined by its optical pitch at that position, wherein the optical pitch is defined as the product of the physical pitch of the grating elements at that position with the effective refractive index presented to light guided by the waveguide at that position. As a result, the laser oscillation wavelength changes when the optical pitch of the grating changes. The invention of Bendett et al. disclosed in Figures 16A and 16B is a DBR waveguide laser and the quality of the laser's output is improved by eliminating changes in the oscillation wavelength. Therefore, one of ordinary skill in the art would have found it obvious to take into account the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path in order to form a grating having a constant optical pitch, so that the oscillation wavelength of the laser remains consistent to improve the output of the laser.

Regarding claims 74 and 91; the means (G) for causing the partial reflections of the light at the at least two reflecting locations comprises a refractive index altering means (G) for altering the effective refractive index of the light conducting medium

(waveguide) presented to light passing along the optical path at each of the at least two reflecting locations for causing the partial reflections (see column 29, lines 60-67).

Regarding claims 75 and 92; the length of each reflecting location (G) in the longitudinal direction of the optical path (waveguide) is relatively short. Bendett et al., however, does not specifically state that the length of each reflection location in the longitudinal direction of the optical path is in the range of 0.3 microns to 200 microns. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the length of each reflection location in the longitudinal direction of the optical path be in the range of 0.3 microns to 200 microns, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (*In re Aller*, 105 USPQ 233), and since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art (*In re Boesch*, 617 F.2d 272, 205 USPA 215 (CCPA 1980)).

Regarding claims 76 and 93; the respective lengths of the reflecting locations (G) along the optical path and the effective refractive indices of the respective reflecting locations (G) are the same in the invention of Bendett et al.

Regarding claim 79; the refractive index altering means (G) comprises a plurality of refractive index altering elements, one refractive index altering element being provided for each reflecting location, the respective refractive index altering elements being located at distances from the first end along the optical path similar to the distances from the first end of the corresponding reflecting location.

Regarding claims 80, 96 and 98; Bendett et al. discloses that each refractive index altering element (grating, G) may be provided by a refractive index altering groove (surface relief grating) formed in a medium (silicon oxide layer) adjacent the light conducting medium (waveguide) but spaced apart therefrom (see claim 1 of Bendett et al.), that the depth of the refractive index altering grooves is the same, and that the refractive index altering element extends substantially transversely relative to the optical path (see Figures 17A and 17B).

Regarding claim 81; Bendett et al. does not disclose that the reflecting locations are formed by a dopant. Gratings, however, are commonly formed by doping regions of a layer or substrate with a dopant to vary the refractive index in that region and create grating fringes, thereby forming gratings. One of ordinary skill in the art would have found it obvious to form the gratings by forming grating fringes with a dopant in the layer disclosed by Bendett et al., since this is a known alternative method for manufacturing gratings in the art and it appears that the invention would perform equally well regardless of the specific method used to form the gratings.

Regarding claim 82; the optical waveguide is a waveguide for laser light.

Regarding claim 86; the means for causing the partial reflections (the grating fringes) cause partial reflections at at least three reflecting locations along the optical path.

Regarding claims 88 and 89; Bendett et al. teaches that a plurality of optical waveguides may be provided in the form of an array (see Figure 1A and Figures 29A and 29B and the corresponding detailed descriptions).

Regarding claim 99; the distance from the first end along the optical path to each reflecting location is measured to the center of the reflecting location.

Claims 73, 74, 85, 86 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashyap (US 6,104,852).

Regarding claim 73; Figures 15a-15d disclose an optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

- a light conducting medium (2, 3a) defining a longitudinally extending optical path for guiding the light, the optical path extending longitudinally between respective spaced apart first and second ends, and
- a means (33, 34) for causing partial longitudinal reflections of the light along the optical path at at least two spaced apart partial reflecting locations along the optical path for deriving light of the predetermined wavelength,
- wherein the means for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective optical length of the optical path, so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting

locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

Bragg gratings, which reflect a narrow wavelength channel, exhibit a main wavelength peak centered on the wavelength to be reflected, and also exhibit reflections at harmonics of the peak wavelength that occur between reflecting locations (fringes) of the grating. The grating disclosed by Kashyap is a Bragg grating and therefore will exhibit the harmonic reflections.

Kashyap does not specifically teach that the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path is taken into account. However, it is known in the art that the optical path length between successive lines in a Bragg grating is affected by variations of the refractive index, the variations in the refractive index being the grating fringes (i.e. the means for causing the partial reflections). The oscillation wavelength of a DBR laser is determined by the Bragg reflection wavelength and the Bragg wavelength at a particular position in a grating is determined by its optical pitch at that position, wherein the optical pitch is defined as the product of the physical pitch of the grating elements at that position with the effective refractive index presented to light guided by the waveguide at that position. As a result, the laser oscillation wavelength changes when the optical pitch of the grating changes. The invention of Kashyap disclosed in Figures 15 and 16 is a DBR waveguide laser and the quality of the laser's output is improved by eliminating changes in the oscillation wavelength. Therefore, one of ordinary skill in the art would have found it obvious to take into account the alteration

to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path in order to form a grating having a constant optical pitch, so that the oscillation wavelength of the laser remains consistent to improve the output of the laser.

Regarding claim 74; the means (33, 34) for causing partial reflections of the light at the at least two reflecting locations comprises a refractive index altering means for altering the effective refractive index of the light conducting medium presented to light passing along the optical path at each of the at least two reflecting locations for causing the partial reflections (see column 10, line 59, through column 11, line 34).

Regarding claim 85; the waveguide is a filter comprising an optical fiber core (2) which forms the light conducting medium for defining the optical path, the optical fiber core (2) being surrounded by a cladding medium (3a) of refractive index different to that of the optical fiber core, and each refractive index altering element (33, 34) is located in and extends around the cladding medium.

Regarding claim 86; the means for causing the partial reflections (the grating fringes) cause partial reflections at at least three reflecting locations along the optical path.

Regarding claim 99; the distance from the first end along the optical path to each reflecting location is measured to the center of the reflecting location.

Claims 73, 82, 83 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US 4,976,539).

Regarding claim 73; Figures 1 and 2 of Carlson et al. disclose an optical waveguide for outputting light of a substantially predetermined wavelength at a particular location, the optical waveguide comprising:

- a light conducting medium (20, 22, 24, 26, 28) defining a longitudinally extending optical path (ridge-type waveguide, see Figure 1) for guiding the light, the optical path extending longitudinally between respective spaced apart first and second ends and
- a means (18) for causing partial longitudinal reflections of the light along the optical path at at least two spaced apart partial reflecting locations along the optical path for deriving light of the predetermined wavelength,
- wherein the means for causing the partial reflections locates the reflecting locations along the optical path at distances from the first end along the optical path which are functions of the effective optical length of the optical path so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

Bragg gratings, which reflect a narrow wavelength channel, exhibit a main wavelength peak centered on the wavelength to be reflected, and also exhibit reflections at harmonics of the peak wavelength that occur between reflecting locations

(fringes) of the grating. The grating disclosed by Carlson et al. is a Bragg grating and therefore will exhibit the harmonic reflections.

Carlson et al. does not specifically teach that the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path is taken into account. However, it is known in the art that the optical path length between successive lines in a Bragg grating is affected by variations of the refractive index, the variations in the refractive index being the grating fringes (i.e. the means for causing the partial reflections). The oscillation wavelength of a DBR laser is determined by the Bragg reflection wavelength and the Bragg wavelength at a particular position in a grating is determined by its optical pitch at that position, wherein the optical pitch is defined as the product of the physical pitch of the grating elements at that position with the effective refractive index presented to light guided by the waveguide at that position. As a result, the laser oscillation wavelength changes when the optical pitch of the grating changes. The invention of Carlson et al. is a DBR waveguide laser and the quality of the laser's output is improved by eliminating changes in the oscillation wavelength. Therefore, one of ordinary skill in the art would have found it obvious to take into account the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path in order to form a grating having a constant optical pitch, so that the oscillation wavelength of the laser remains consistent to improve the output of the laser.

Regarding claim 82; the optical waveguide is for laser light.

Regarding claim 83; a ridge is formed on the surface of the semiconductor laser waveguide for defining the optical path through the light conducting medium and the refractive index altering elements (18) are located in the ridge at locations corresponding to the reflecting location.

Regarding claim 86; the means for causing the partial reflections (the grating fringes) cause partial reflections at at least three reflecting locations along the optical path.

Allowable Subject Matter

Claims 77, 78, 87, 94, 95, 97, 101 and 102 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art cited on attached form PTO-892 is the most relevant prior art known, however, the invention of claims 75, 77, 78, 87, 94, 95, 97, 101 and 102 distinguishes over the prior art of record for the following reasons.

Regarding claim 77; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 77, characterized in that the distance of each reflecting location from the first end along the optical path is a function of the product of half the length of that reflecting location and the difference between its effective refractive index and the actual refractive index of the light conducting medium defining the optical path in combination with the limitations of the base and intervening claims.

Regarding claim 78; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 78, characterized in that the distance of the p^{th} reflecting location from the first end along the optical path is provided by the formula defined in claim 78 in combination with the limitations of the base and intervening claims.

Regarding claim 87; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 87, wherein the reflecting locations are provided at respective distances from the first end which correspond to the following fractions of the actual length of the optical path, namely, 1/16, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8 and 3/4 along the optical path in combination with the limitations of the base and intervening claims.

Regarding claim 94; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method as defined in claim 94, characterized in that the distance of the p^{th} reflecting location from the first end along the optical path is provided by the formula defined in claim 94 in combination with the limitations of the base and intervening claims.

Regarding claim 95; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 95, wherein the respective lengths of the reflecting locations along the optical path are different, and the effective refractive

indices of the respective reflecting locations are different in combination with the limitations of the base and intervening claims.

Regarding claim 97; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 97, wherein the depth of the refractive index altering grooves is different in combination with the limitations of the base and intervening claims.

Regarding claim 101; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious an optical waveguide as defined in claim 101, wherein the reflecting locations are provided at respective distances from the first end which correspond to the following fractions of the actual length of the optical path, namely, 1/14, 1/7, 3/14, 2/7, 3/7, 4/7 and 5/7 along the optical path in combination with the limitations of the base and intervening claims.

Regarding claim 102; the claim is allowable over the prior art of record because none of the references either alone or in combination disclose or render obvious a method as defined in claim 102, wherein the respective lengths of the reflecting locations along the optical path are different, and the effective refractive indices of the respective reflecting locations are different in combination with the limitations of the base and intervening claims.

Hence, there is no reason or motivation for one of ordinary skill in the art to use the prior art of record to make the invention of claims 77, 78, 87, 94, 95, 97, 101 and 102.

Response to Arguments

Applicant's arguments filed November 4, 2004 have been fully considered but they are not persuasive.

The Drawing rejections, Claim objections, and Claim rejections under 35 U.S.C. 112, 2nd paragraph set forth in the previous Office action are withdrawn in view of Applicant's Amendment filed November 4, 2004.

Regarding prior art rejections to independent claims 73 and 90 over Bendett et al. (US 6,636,678 B1), Carlson et al. (US 4,976,539), or Kashyap (US 6,104,852); Applicant states that claims 73 and 90 have been revised (amended) to make it clear that the means for causing the partial reflections locates the reflecting locations along the optical path at distances form the first end along the optical path which are functions of the effective optical path length of the optical path, taking account of the alterations to the actual length of the optical path resulting form the effect of the means for causing the partial reflections, so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing waves set up between the first and second ends, are all in harmonic relationship with each other. Applicant states that the cited references do not disclose or suggest this feature.

Bendett et al., Carlson et al. and Kashyap each disclose Bragg gratings. Bragg gratings, which reflect a narrow wavelength channel, exhibit a main wavelength peak centered on the wavelength to be reflected, and also exhibit reflections at harmonics of

the peak wavelength that occur between reflecting locations (fringes) of the grating. For reference, see paragraph [0007] of Kashyap (US 2001/0031114 A1). Thus, the Bragg gratings disclosed by Bendett et al., Carlson et al. and Kashyap will exhibit the harmonic reflections.

Neither Bendett et al., Carlson et al. or Kashyap specifically teach that the alteration to the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path is taken into account. However, it is known in the art that the optical path length between successive lines in a Bragg grating is affected by variations of the refractive index, the variations in the refractive index being the grating fringes (i.e. the means for causing the partial reflections). For reference, see column 6, lines 25-28 of Erdogan et al. (US 5,712,715). The oscillation wavelength of a DBR laser is determined by the Bragg reflection wavelength and the Bragg wavelength at a particular position in a grating is determined by its optical pitch at that position, wherein the optical pitch is defined as the product of the physical pitch of the grating elements at that position with the effective refractive index presented to light guided by the waveguide at that position. For reference, see column 2, lines 14-21, of Oka et al. (US 5,177,758) and column 2, lines 14-20 of Robinson (US 5,717,799). As a result, the laser oscillation wavelength changes when the optical pitch of the grating changes. The inventions of Bendett et al., Carlson et al. and Kashyap are DBR waveguide lasers and the quality of the laser's output is improved by eliminating changes in the oscillation wavelength. Therefore, one of ordinary skill in the art would have found it obvious to take into account the alteration to

the actual length of the optical path resulting from the effect of the means for causing the partial reflections on the actual length of the optical path in order to form a grating having a constant optical pitch, so that the oscillation wavelength of the laser is consistent to improve the output of the laser.

Kashyap (US 2001/0031114 A1), Erdogan et al. (US 5,712,715), Oka et al. (US 5,177,758), and Robinson (US 5,717,799) are cited above solely to provide broad teachings of well known features of Bragg gratings and have not been relied upon for a rejection.

Applicant's further state that claims 74-83, 86-89 and 91-102 are dependent from one of 73 and 90 and are patentable over the prior art for the same reasons as claims 73 and 90. Examiner disagrees for the reasons discussed above with respect to claims 73 and 90.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning the merits of this communication should be directed to Examiner Michelle R. Connelly-Cushwa at telephone number (571) 272-2345. The examiner can normally be reached 9:00 AM to 7:00 PM, Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general or clerical nature should be directed to the Technology Center 2800 receptionist at telephone number (571) 272-1562.

Michelle R. Connelly-Cushwa

Michelle R. Connelly-Cushwa
Patent Examiner
January 14, 2005